Paper No. 22

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte BURKHARD KÖHLER,
JOACHIM PROBST and MICHAEL SONNTAG

Appeal No. 2004-1131
Application 09/562,632

ON BRIEF

Before PAK, WARREN and TIMM, *Administrative Patent Judges*.

WARREN, *Administrative Patent Judge*.

Decision on Appeal

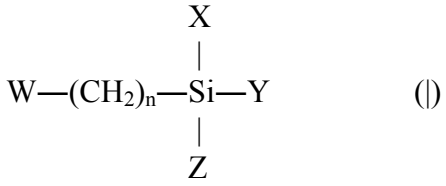
This is an appeal under 35 U.S.C. § 134 from the decision of the examiner finally rejecting claims 1 through 7, all of the claims in the application. Claim 1 is illustrative of the claims on appeal:

1. A coating composition comprising

a) 30 to 95 wt.% of an aqueous, hydroxy-functional, acid-group containing resin dispersion,

b) 5 to 70 wt.% of a polyisocyanate component having a free isocyanate group content of 5 to 50 wt.% and a viscosity of 5 to 10,000 mPa.s at 23°C and D = $40s^{-1}$ and

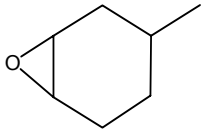
c) 0.1 to 10 wt.% of a silane component, inert to isocyanate groups, of the general formula (|)



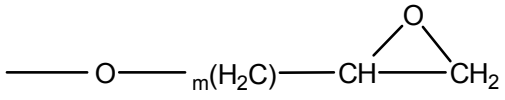
(|)

wherein

W denotes the group



or



with m = 1 to 4 and

n denotes a whole number from 2 – 4

and

X, Y, Z represent, independently of one another, the same or different organic groups with 1 to 30 atoms, with the proviso that at least one of the groups represents an alkoxy group with 1 to 4 carbon atoms,

wherein the molar ratio of the hydroxyl groups of component a) to the isocyanate groups of component b) is between 0.2 : 1 and 3 : 1, and the same of the wt.% of components a) to c) is 100.

The appealed claims, as represented by claim 1, are drawn to a coating composition comprising at least the three components in the amounts specified in the claim. According to appellants, the claimed composition can form an aqueous two-component polyurethane coating composition with "improved adhesion and corrosion resistance, preferably on metal substrates, such as aluminum and steel and car body sheet" (specification, e.g., page 1).

The references relied on by the examiner are:

Kubitza et al (Kubitza)	5,075,370	Dec. 24, 1991
Tsuno et al. (Tsuno)	5,109,057	Apr. 28, 1992
Hatano et al. (Hatano)	5,527,616	Jun. 18, 1996

The examiner has rejected appealed claims 1 through 7 under 35 U.S.C. § 103(a) as being unpatentable over Kubitza in view of Tsuno and Hatano.

Appellants state that the appealed claims "stand or fall together" (brief, page 3). Thus, we decide this appeal based on appealed claim 1. 37 CFR § 1.192(c)(7) (2002).

We affirm.

Rather than reiterate the respective positions advanced by the examiner and appellants, we refer to the examiner's answer and to appellants' brief for a complete exposition thereof.

Opinion

In order to review the examiner's application of prior art to appealed claim 1, we must first interpret the language thereof by giving the claim terms their broadest reasonable interpretation consistent with the written description provided in appellants' specification as it would be interpreted by one of ordinary skill in this art, *see In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997), without reading into these claims any limitation or particular embodiment which is disclosed in the specification. *See Morris*, *supra*; *In re Zletz*, 893 F.2d 319**,** 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989); *In re Priest*, 582 F.2d 33, 37, 199 USPQ 11, 15 (CCPA 1978). The plain language of claim 1 specifies a composition comprising at least the three ingredients in the amounts specified in the claim. *See generally*, *Exxon Chem. Pats., Inc. v. Lubrizol Corp.*, 64 F.3d 1553, 1555, 35 USPQ2d 1801, 1802 (Fed. Cir. 1995) ("The claimed composition is defined as comprising - meaning containing at least - five specific ingredients."); *In re Baxter*, 656 F.2d 679, 686-87, 210 USPQ 795, 802-03 (CCPA 1981) ("As long as one of the monomers in the reaction is propylene, any other monomer may be present, because the term 'comprises' permits the *inclusion* of other steps, elements, or materials.").

Appellants, in summarizing the invention, state that the silanes of formula "(|)" will "form i) an ester bond with the acid group(s) of the aqueous, hydroxy-functional, acid group containing resin dispersion," citing page 5, lines 16-17 of the specification, and further argue this reaction as a distinction of the claimed invention vis-à-vis Hatano and Tsuno (brief, pages 2 and 4-5). The examiner contends that "the claimed coating composition does not require any sort of reaction between the silane and the acid group containing resin dispersion" (answer, page 5; see also page 6). We agree with the examiner because we find no limitation in claim 1 with respect to the acid value of the resin dispersion, and we will not read any limitation from the specification (e.g., page 4, lines 13-14, and the Examples) into the claim. *See Morris*, *supra*; *Zletz*, *supra*; *Priest*, *supra*. We further determine that when the term "coating" is considered in the context of the claim language as a whole as well as in light of the written description in appellants'

specification, it merely reflects the intended use of the composition and adds no additional limitation(s) to the specified ingredients therein. *See generally, Corning Glass Works v. Sumitomo Elect. U.S.A., Inc.*, 868 F.2d 1251, 1257, 9 USPQ2d 1962, 1966 (Fed. Cir. 1989); *In re Stencel*, 828 F.2d 751, 754-55, 4 USPQ2d 1071, 1073 (Fed. Cir. 1987); *In re Tuominen*, 671 F.2d 1359, 213 USPQ 89 (CCPA 1982). Thus, we interpret appealed claim 1 to encompass compositions containing at least the three specified components as of the time the components are mixed together. *See Exxon Chem. Pat.*, 64 F.3d at 1556-58, 35 USPQ2d at 1803-05 ("Consequently, as properly interpreted, Exxon's claims are to a composition that contains the specified ingredients at any time from the moment at which the ingredients are mixed together.").

We have carefully reviewed the record on this appeal and based thereon find ourselves in agreement with the supported position advanced by the examiner (answer, pages 3-4) that, *prima facie*, one of ordinary skill in this art would have found in the combined teachings of Kubitza, Tsuno and Hatano the reasonable suggestion that the composition comprising an aqueous, hydroxy-functional, acid-group containing resin dispersion and a polyisocyanate of Kubitza can be modified by the addition of an epoxy group and alkoxy group containing silane coupling agent with the reasonable expectation of obtaining a coating composition with good adhesion to metal surfaces.

Accordingly, since a *prima facie* case of obviousness has been established over the combined teachings of Kubitza, Tsuno and Hatano by the examiner, we have again evaluated all of the evidence of obviousness and nonobviousness based on the record as a whole, giving due consideration to the weight of appellants' arguments in the brief. *See generally, In re Johnson*, 747 F.2d 1456, 1460, 223 USPQ 1260, 1263 (Fed. Cir. 1984); *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984).

As recognized by the examiner (answer, pages 4-5), appellants do not dispute that the specified ingredients of the claimed compositions encompassed by appealed claim 1 as we interpreted it above, are found in Kubitza, Tsuno and Hatano as stated by the examiner. Instead, the issue framed by appellants is whether one of ordinary skill in this art would have combined the references so as to arrive at the claimed compositions.

Appellants point out that Kubitza "does not disclose or suggest that a silane of any kind could or should be used in the compositions described therein," and "does not contain the slightest hint that there are any adhesion or corrosion resistant problems with the compositions described therein" (brief, page 3). Appellants further point out that Hatano discloses a hot-melt adhesive for flexible-packaging laminates prepared from a prepolymer obtained by "reacting an excess of isocyanate with a polyol" wherein "[t]he reference nowhere indicates whether the . . . [polyester polyols] also contain acid-groups," and thus, although Hatano discloses three different methods to use the silane coupling agent, "there can be no reaction between an epoxy-containing silane and an acid group" (*id.*, page 4). Appellants note that "none of the working examples" of Hatano use an epoxy-containing silane (*id.*). Appellants point out that Tsuno "does not disclose or suggest any aqueous based compositions" in disclosing compositions that "comprise a silane coupling component and an alkoxy silylated NCO-containing prepolymer," wherein the "prepolymer contains no acid groups, so that there could never be a reaction between epoxy groups and acid groups" (*id.*, pages 4-5).

On this basis, appellants submit that there is no motivation to combine the references because Hatano and Tsuno do not "relate to aqueous-based compositions" as does Kubitza, and neither suggests "the use of a component which contains both hydroxy and acid functionality," and thus "[o]ne of ordinary skill in this art would not look to either of [Hatano or Tsuno] to solve any problems associated with the compositions of' Kubitza" (*id.*, page 5). Appellants allege that even if this person was "motivated to combine the teachings of the references . . . the results described in the instant specification would clearly amount to unexpected results" (*id.*).

The examiner responds that Hatano in disclosing three different methods to use the silane coupling agent, teaches that "no reaction is per se necessary for the coupling component to work," and that the absence of a working example of an epoxy-containing silane coupling agent does not limit the teachings of the reference (answer, page 5). The examiner submits that the motivation for incorporating the silane coupling agent of Hatano into the composition of Kubitza "would have been to improve the adhesion of the coating composition" (*id.*). The examiner further responds that appellants' arguments that Tsuno does not disclose aqueous based compositions or a prepolymers with acid groups are not persuasive because no reaction between

the epoxy group of the silane coupling agent and an acid group of the resin dispersion is required by any claim limitation (*id.*, page 6). The examiner submits that the epoxysilane coupling agents of Hatano and Tsuno would be expected to function as coupling agents in the compositions of Kubitza, improving the adhesive capabilities thereof, and appellants have not pointed to evidence of record that establishes otherwise (*id.*).

We find that Kubitza does teach that the disclosed coating compositions can be used for, *inter alia*, "the painting and coating of metal surfaces" (col. 7, line 1), but does not disclose using any silane coupling agent, as appellants point out. Appellants acknowledge that "adhesion problems have been observed with these [acknowledged] aqueous [two component] [polyurethane] systems after application on special substrate surfaces, especially untreated metal surfaces such as aluminum, galvanized steel and car body sheet (USt 1405 steel sheet)" which "can then lead to undesirable signs of corrosion" (specification, page 2; see also page 1). Thus, on this record, we find that one of ordinary skill in this art would have readily observed that such aqueous coating compositions can corrode metal surfaces, *see In re Goodman*, 339 F.2d 228, 232-33, 144 USPQ 30, 33-34 (CCPA 1964), and there is no evidence that recognition of this problem is part of appellants' claimed invention. *See, e.g., In re Ludwig*, 353 F.2d 241, 243, 147 USPQ 420, 421 (CCPA 1965); *In re Sponnoble*, 405 F.2d 578, 585, 160 USPQ 237, 243 (CCPA 1969). It is well settled that "[t]he significance of evidence that a problem was known in the prior art is, of course, that knowledge of a problem provides a reason or motivation for workers in the art to apply their skill to its solution." *In re Nomiya*, 509 F.2d 566, 574, 184 USPQ 607, 613 (CCPA 1975). Therefore, we are of the view that one of ordinary skill in this art would have addressed the problem of adhesion of the aqueous coating compositions on metal surfaces leading to corrosion.

We find that Hatano discloses solvent-less isocyanate-terminated polyurethanes which can be used as hot-melt adhesive agent coating compositions for metal foils, such as aluminum and steel foils, in a laminate and moisture cured (cols. 1-3, 4-7 and 11-15). The polyol can be a polyether or a polyester, and when a polyester is used, it is prepared from a diol and a dicarboxylic acid (cols. 7-9, particularly col. 8, lines 8-48). We note in the latter respect, that there is no limitation in Hatano on the ratio of diol to dicarboxylic acid in forming the polyester,

such that the presence of acid groups would be excluded. Thus, while appellants correctly point out that Hatano does not disclose that the resulting polyester polyol contains acid groups, we find that one of ordinary skill in the art would have reasonably inferred from the teachings of the reference that acid groups can be present in the polyester polyol.[1]

We further find that Hatano discloses that "[f]or applications where a high degree of adhesion is required for metal foil or the like, a silane coupling component should be used in combination," wherein the silane coupler components falling within the structural formula "(3)" can contain "an epoxy group" and three lower alkoxy groups (col. 10, lines 40-54). Hatano exemplifies "epoxy silanes such as a γ-glycidoxypropyltriethanolsilane" (col. 10, lines 56-57), which is disclosed by appellants as "(3-glycidoxypropyl)triethoxysilane" (specification, page 5, line 20).

As both appellants and the examiner recognize, Hatano does not limit the manner in which the silane coupling agent is used, and sets forth three ways, including, *inter alia*, use as a primer diluted with water, and "the polyol, polyisocyanate and silane coupling agent are reacted together to synthesize the polyurethane prepolymer," wherein in the latter, "the silane coupling agent can be used in an amount of up to 10 parts by weight per 100 parts by weight of the isocyanate-terminated polyurethane" (col. 10, line 60, to col. 11, line 5, and col. 11, lines 12-14 and 16-19). Indeed, the latter example sets forth a composition that comprises a hydroxy-functional resin which can contain acid groups, a polyisocyanate with free isocyanate groups, and a silane coupling agent component prior to forming the polyurethane prepolymer, and thus differs from the claimed compositions encompassed by appealed claim 1 in that the resin is not in the form of an aqueous dispersion. *Cf. Exxon Chem. Pat.*, 64 F.3d at 1556-58, 35 USPQ2d at 1803-05.

We find that Tsuno acknowledges that silane coupling agents, including epoxysilanes, were known as primers for adhesives used with metals, and disclose a primer coating

[1] It is well settled that a reference stands for all of the specific teachings thereof as well as the inferences one of ordinary skill in this art would have reasonably been expected to draw therefrom, *see In re Fritch*, 972 F.2d 1260, 1264-65, 23 USPQ2d 1780, 1782-83 (Fed. Cir. 1992); *In re Preda*, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968), presuming skill on the part of this person. *In re Sovish*, 769 F.2d 738, 743, 226 USPQ 771, 774 (Fed. Cir. 1985).

composition of a silane coupling agent and an alkoxysilylated NCO-containing urethane prepolymer which has "improved adhesion properties to . . . metal" (e.g., col. 1-2, particularly col. 1, lines 7-13). Among the examples of epoxysilanes used as silane coupling agents by Tsuno are "γ-glycidoxypropyltrimethoxylsilane" and "3,4-epoxycyclohexylethyl-trimethoxysilane" (col. 2, lines 24-26), disclosed by appellants as the preferred "(3-glycidoxypropyl)triethoxysilane" and "β-(3,4-epoxycyclohexyl)ethyltrimethoxysilane" (specification, page 5, lines 19-21, 23-24 and 26). As appellants point out, the diol used by Tsuno does not contain acid groups and the compositions are not aqueous based (e.g., col. 3). Indeed, Tsuno further discloses that "a part or whole of the NCO groups remained [sic] in the polyisocyanate thus reacted is reacted with the NCO reactive silane" (col. 2, lines 58-61). In Example 2, Tsuno applies a disclosed composition to a stainless steel plate (col. 5).

We find that the combined teachings of Kubitza, Hatano and Tsuno provide substantial evidence in support of the examiner's position. Indeed, one of ordinary skill in this art would have found in the disclosures of Hatano and Tsuno the reasonable suggestion that silane coupling agents containing epoxy and lower alkoxy groups can improve adhesion to metals of different urethane compositions by using the epoxysilane coupling agents as a primer for the composition or mixed in the composition at various stages. In this respect, Hatano would have taught that these epoxysilane coupling agents can be mixed with a polyester polyol which can contain acid groups, and a polyisocyanate to form a composition. Thus, we determine that one of ordinary skill in this art would have been motivated by the combined teachings of the references to included an epoxysilane coupling agent, such as those disclosed by Hamates and Tsuno, in the coating compositions of Kubitza in the reasonable expectation of improving the adhesion of the composition to metal surfaces, such as aluminum and steel, to address the problem of corrosion recognized in the art for such compositions. Thus, this person would have reasonably arrived at the claimed coating composition encompassed by appealed claim 1 without recourse to appellants' specification. S*ee In re Corkill*, 771 F.2d 1496, 1497-1500, 226 USPQ 1005, 1006-08 (Fed. Cir. 1985); *In re Skoll*, 523 F.2d 1392, 1397-98, 187 USPQ 481, 484-85 (CCPA 1975); *In re Castner*, 518 F.2d 1234, 1238-39, 186 USPQ 213, 217 (CCPA 1975); *In re Lintner*, 458 F.2d 1013, 1015-16, 173 USPQ 560, 562-63 (CCPA 1972); *see also In re Vaeck*, 947 F.2d

488, 493, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991) ("Both the suggestion and the reasonable expectation of success must be founded in the prior art, not in the applicant's disclosure."); *In re O'Farrell*, 853 F.2d 894, 903-04, 7 USPQ2d 1673, 1680-81 (Fed. Cir. 1988) ("Obviousness does not require absolute predictability of success. . . . There is always at least a possibility of unexpected results, that would then provide an objective basis for showing the invention, although apparently obvious, was in law nonobvious. [Citations omitted.] For obviousness under § 103, all that is required is a reasonable expectation of success. [Citations omitted.]"); *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981) ("The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.").

We are not convinced otherwise by appellants' contention that the working examples of Hamates do not used an epoxysilane coupling agent as a preferred embodiment, and indeed, we found above that this reference discloses an example of such a coupling agent. *See In re Lamberti*, 545 F.2d 747, 750, 192 USPQ 278, 280 (CCPA 1976) ("[T]he fact that a specific [embodiment] is taught to be preferred is not controlling, since all disclosures of the prior art, including unpreferred embodiments, must be considered."). Appellants also allege in the brief that "results . . . in the instant specification would clearly amount to unexpected results" (page 5), but do not identify in the brief the comparisons that provide the "unexpected results" or why the "results" are "unexpected." Indeed, appellants have the burden to identify the evidence on which they rely and submit an explanation or evidence with respect to the practical significance of such results vis-à-vis the teachings of the applied references and why the results would have been considered unexpected. *See generally, In re Geisler*, 116 F.3d 1465, 1470, 43 USPQ2d 1362, 1365-66 (Fed. Cir. 1997); *In re Merck*, 800 F.2d 1091, 1099, 231 USPQ 375, 381 (Fed. Cir. 1986); *In re Longi*, 759 F.2d 887, 897, 225 USPQ 645, 651-52 (Fed. Cir. 1985); *In re Lindner*, 457 F.2d 506, 508, 173 USPQ 356, 358 (CCPA 1972); *In re Klosak*, 455 F.2d 1077, 1080, 173 USPQ 14, 16 (CCPA 1972); *In re D'Ancicco*, 439 F.2d 1244, 1248, 169 USPQ 303, 306 (1971). We will not attempt to independently determine the comparisons on which appellants rely or the

significance thereof. *Cf. In re Baxter Travenol Labs.*, 952 F.2d 388, 392, 21 USPQ2d 1281, 1285 (Fed. Cir. 1991) ("It is not the function of this court to examine the claims in greater detail than argued by appellant, looking for nonobvious distinctions over the prior art.").

Accordingly, based on our consideration of the totality of the record before us, we have weighed the evidence of obviousness found in the combined teachings of Kubitza, Hatano and Tsuno with appellants' countervailing evidence of and argument for nonobviousness and conclude that the claimed invention encompassed by appealed claims 1 through 7 would have been obvious as a matter of law under 35 U.S.C. § 103(a).

The examiner's decision is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

CHUNG K. PAK Administrative Patent Judge	)	
CHARLES F. WARREN Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
CATHERINE TIMM Administrative Patent Judge	)	

Patent Department
Bayer Corporation
100 Bayer Road
Pittsburgh, PA 15205-9741